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obstructed the flow of the valley stream. Its surface is strewn with large blocks of rock. Its volume is estimated at 900,000,000 cu. m. A little farther east, in a branch of the Kander valley, a similar but much smaller slide forms the barrier by which Oeschinen lake is enclosed in a cirque-like valley head.

Turnau quotes estimates of the volumes of other landslides. That of Elm, which happened a score of years ago, is 10,000,000 cu. m.; that of Goldau, a century ago, 15,000,000. Far greater was the prehistoric landslide of Flims in the upper valley of the Rhine, which is estimated at 15,000,000,000 cu. m.; or a thousand times greater than the Goldau slide, and even sixteen times greater than the great slide of the Kander valley.

W. M. D.

PRELIMINARY LIST OF SCIENTIFIC COMMUNICATIONS TO BE PRESENTED AT
THE SEVENTH INTERNATIONAL
ZOOLOGICAL CONGRESS, BOSTON,
AUGUST 19 TO 23,
1907

IN response to the invitations of the General Committee and of the various secretaries of the organization a generous number of acceptances to address the congress or to read papers before its sections have been received. The communications thus submitted fall under three heads: addresses, for which the speakers have been invited; voluntary communications to be given before sections; and demonstrations. The number and quality of these contributions presage an unusually successful meeting.

The following speakers have consented to deliver addresses either before the general meetings or the sectional meetings: Professor W. Bateson, Cambridge, England; Professor C. Depéret, Lyons, France; Dr. H. Driesch, Heidelberg, Germany; Dr. T. N. Gill, Washington, D. C.; Professor Richard Hertwig, Munich, Germany; Dr. G. Horváth, Budapest, Hungary; Dr. L. O. Howard, Washington, D. C.; Professor A. A. W. Hubrecht, Utrecht, Holland; Professor J. Loeb, Berkeley, Cal.; Professor C. E. McClung, Lawrence, Kan.; Professor J. P. McMurrich, Ann Arbor, Mich.;

Sir John Murray, Edinburgh, Scotland; Dr. R. F. Scharff, Dublin, Ireland; and Professor C. O. Whitman, Chicago, Ill.

For the presentation and discussion of scientific communications fifteen sections have been tentatively named and the organization of each section has been put into the hands of a secretary to whom requests concerning that section should be addressed. The names of the sections and the persons having charge of them are as follows: General Zoology, F. R. Lillie, Chicago, Ill.; Systematic Zoology, D. S. Jordan, Stanford University, Cal.; Entomology, L. O. Howard, Washington, D. C.; Ornithology, Witmer Stone, Philadelphia, Pa.; Palæozoology, H. F. Osborn, New York, N. Y.; Comparative Anatomy, C. S. Minot, Boston, Mass., and J. S. Kingsley, Tufts College, Mass.; Embryology, E. G. Conklin, Philadelphia, Pa.; Cytology, E. B. Wilson, New York, N. Y.; Zoogeography, L. Stejneger, Washington, D. C.; Thalassography, W. E. Ritter, Berkeley, Cal.; Applied Zoology, C. W. Stiles, Washington, D. C.; Comparative Physiology, W. B. Cannon, Boston, Mass.; Experimental Zoology, T. H. Morgan, New York, N. Y.; Heredity, C. B. Davenport, Cold Spring Harbor, N. Y., and Animal Behavior, H. S. Jennings, Baltimore, Md.

The following preliminary list of communications is announced for the sectional meetings:

T. B. ALDRICH: Title not yet received.

R. J. ANDERSON: "Notes on the Movements in Some Animals, with especial reference to their Susceptibility to Training," "A Short Review of the Mammalian Mandible," "Illustrations Suggestive of the Mode of Formation of the Cetacean Flipper."

S. VON APÁTHY: "New Method of Making Serial Celloidin Sections," "An Unintentional Experiment on Living Nuclei and the Real Structure of the Cell Nucleus," "New Facts and Critical Notes about Neurofibrillæ," "The Presence of Krause's Membrane as a General Feature of Striated Muscles."

S. AWEKINZEW: "Ueber die Myxosporidien von *Drepanopsetta platessoides*," "Die Marine Biologische Station an der Murman-Küste."

C. R. BARDEEN: Title not yet received.

P. BARTSCH: "A Study in Distribution based

on the Family Pyramidellidæ of the West Coast of America."

W. BATESON: Title not yet received.

C. W. BEEBE: "Geographic Variation in Birds, with special reference to Humidity."

R. R. BENSLEY: "An Analysis of the Salivary Glands of Mammals based on Cellular Characters."

E. A. BIRGE: Title not yet received.

R. BLANCHARD: Title not yet received.

MARY BLOUNT: "On the Cleavage and Formation of the Periblast and the Germ Wall in Pigeons."

KRISTINE BONNEVIE: Title not yet received.

G. M. BOWERS: "Work of the *Albatross*."

K. BRANDT: Title not yet received.

W. S. BRUCE: "Life of the Sea in the Antarctic Regions."

H. L. BRUNER: "Cephalic Brains of Reptiles."

E. BUGNION: "Fasceux spermatiques doubles (bipolaires) des Ténértrions et des Milabres de Ceylon et d'Egypte."

G. N. CALKINS: "Origin and Division of the Maturation Chromosomes in *Paramœcium*."

R. E. CALL: "Revision of the North American Unionide."

W. B. CANNON: "The Acid Control of the Pylorus."

W. B. CANNON and H. H. SMITH: "Some Observations on the Action of the Cardia with reference to a Probable General Law of Motor Activity in the Alimentary Canal."

A. J. CARLSON: "On Salivary Secretions."

W. E. CASTLE: "Reversion and the Fixation of Characters," "The Mendelian Inheritance of Sex."

FRANK M. CHAPMAN: "Remarks on the Geographical Origin of North American Birds." (With slides.)

C. M. CHILD: "Amitosis and Mitosis in Normal and Regular Growth."

T. D. A. COCKERELL: "The Miocene Fauna of Florissant, Colorado."

W. R. COE: Title not yet received.

L. W. COLE: "Behavior of Raccoons under Experimental Conditions."

C. CORRENS: Title not yet received.

E. R. CORSON: "Fusion of Cuneiform and Semilunar Bones."

R. P. COWLES: Title not yet received.

W. C. CURTIS: Title not yet received.

W. H. DALL: "Deep-water Distribution of the Molluscan Fauna of the Northwest Coast."

W. DANTCHAKOFF: "Ueber die Entwicklung der Blutelemente beim Hühnerembryo."

A. D. DARBISHIRE: "Mendelian and Sexual Inheritance."

H. B. DAVIS: "The Behavior of Raccoons."

A. DAVISON: "Modifications of Structure in a Dog born with Three Legs."

J. DAWSON: "The Behavior of Physa."

B. DEAN: "'Precocious Segregation' as shown in Series of Vertebrate Embryos and its Significance in Mosaic Development."

K. DERJUGIN: "Murmansche Biologische Station der K. Naturforscher Gesellschaft St. Petersburg und ihre Untersuchungen im nordischen Eismeere."

H. H. DONALDSON: "The Nervous System of *Rana virescens* compared with that of *Rana temporaria* and *R. esculenta*."

HANS DRIESCH: "The Stimuli of Restitutions."

J. E. DUERDEN: "The Influence of Domestication on the Behavior of the Ostrich."

H. G. DYAR: "The Distribution of Mosquitoes in North America."

C. L. EDWARDS: "Variations in the Holothurioidea."

C. H. EIGENMANN: "The Ecology of the Cuban Blind Fishes," "Origin and Distribution of South American Fresh-water Fishes."

B. W. EVERMANN: "The Origin of the Golden Trout of the Southern High Sierra."

E. FAWCETT: "The Development and Ossification of Certain Bones in the Human Body."

P. A. FISH: "The Exchange of Air in the Gut-tural Pouches of the Horse."

O. FOLIN: "On Protein Metabolism in Fasting."

S. A. FORBES: "A Statistical Study of the Local Distribution and Ecology of Birds."

A. FROBIEP: "Ueber die Cranio-vertebralgrenze bei den Amphibien, im Vergleich zu Selachier und Amnioten."

S. H. GAGE: "Glycogen in the Embryos of *Petro-myzon*, *Amblystoma* and *Gallus*," "Glycogen in the Embryo."

S. P. GAGE: "A Four-weeks Human Embryo," "Method of Making Models of Blotting-paper instead of Wax," "Brain of a Six-weeks Human Embryo."

A. GAUDRY: Title not yet received.

T. N. GILL: "The Incongruity of Inland and Marine Fauna."

O. C. GLASER: "A Rapid Method of Demonstrating Habit Formation."

J. GOLDBERGER: Title not yet received.

L. VON GRAFF: "Zur Anatomie der nordamerikanischen Turbellarien," "Vergleichung der nordamerikanischen und europäischen Turbellarien-fauna."

C. GRAVE: Title not yet received.

- C. C. GUTHRIE: "Further Results of Transplantation of Ovaries in Chickens."
- M. F. GUYER: "Deficiencies of the Chromosome Theory of Heredity," "Results of Injecting Blood and Lymph into Unfertilized Frog Eggs."
- P. B. HADLEY: "The Behavior of Young Stages of the Lobster."
- G. V. HAMILTON: "An Experimental Study of an Unusual Type of Reaction in a Dog."
- C. W. HARGITT: "The Behavior of Tubicolous Animals," "The Organization and Early Development of Cœlenterate Eggs."
- M. HARTOG: "Rheotaxy of Copepods and Rotifers."
- Y. HENDERSON: "A Graphic Expression of the Principles Underlying the Normal Variations in the Behavior of the Mammalian Heart."
- H. W. HENSHAW: "The Zoogeographic Work of the Biological Survey."
- W. A. HERDMAN: Title not yet received.
- W. B. HERMS: "The Reactions of Sarcophagid Fly Larvæ to Light."
- A. L. HERRERA: "The Comparative Behavior of Insects and of Winged Seeds," "Plasmogeny, a New Experimental Science."
- F. H. HERRICK: "Organization of the Gull Community: a Study of the Communal Life of Birds."
- M. HERZOG: "On the Earliest Stage of Placentation and on the Earliest Development of the Embryo in Man."
- L. T. HOBHOUSE: "The Importance of Animal Psychology for the Theory of Evolution."
- G. HORVÁTH: "Relations entre les faunes hémipéteriologiques de l'Europe et de l'Amérique du Nord."
- L. O. HOWARD: Title not yet received.
- W. E. HOYLE: "The Cephalopoda of the *Albatross* Expedition, 1904-5."
- G. S. HUNTINGTON and C. F. W. McCLURE: "The Early Stages in the Development of the Mammalian Lymphatic System and their Correlation to the Embryonic Venous Channels," "Anatomy and Development of the Lymph-sac and Thoracic Duct in the Domestic Cat."
- C. C. HURST: "Unit Characters in Animals and Plants."
- H. S. JENNINGS: Title not yet received.
- R. H. JOHNSON: "Heredity of Color Pattern in Coccinellid Beetles."
- J. B. JOHNSTON: "The Phylogenetic History of the Somatic Sensory Column of the Vertebrate Brain."
- W. E. KELLICOTT: "The Degree of Correlation as a Selective Basis."
- V. L. KELLOGG: "Heredity in Silkworms."
- J. S. KINGSLEY: "A Neglected Point in the Quadrate Problem."
- P. KYES: "The Lecithin Content of the Red-blood Corpuscles and its Relation to the Stroma."
- A. LANG: "Hybrids of *H. nemoralis* and *H. hortensis*."
- F. S. LEE: "The Nature and Cause of Muscle Fatigue."
- F. T. LEWIS: Title not yet received.
- E. LINTON: "Notes on the Distribution of Entozoa of North American Marine Fishes."
- W. A. LOCY: "The Fifth and Sixth Aortic Arches in Birds and Mammals," "Injected and Dissected Chick Embryos showing Fifth and Sixth Aortic Arches," "The Nervus Terminalis in Selachians."
- A. M. LUTZ: "A Study of the Chromosomes of *Oenothera Lamarckiana*: its Mutants and Hybrids."
- F. E. LUTZ: "Inheritance of Abnormal Wing Venation in *Drosophila*."
- M. W. LYON, JR.: "The Distribution of Bats in the Zoogeographical Regions."
- O. MAAS: "Kaltenziehung und Hunger bei Spongien."
- J. P. McMURRICH: "Intermembral Homologies."
- C. L. MARLATT: Title not yet received.
- S. O. MAST: "Light Reaction in *Volvox*."
- W. D. MATTHEW: Title not yet received.
- A. G. MAYER: "The Annual Swarming of the Atlantic Palolo," "A System of the Hydromedusæ," "Vantage Grounds for the Study of the Marine Life of the West Indian Region," "Factors Controlling Rhythmical Pulsation."
- A. MAXIMOW: "Ueber die Entwicklung der Blutelemente beim Säugetierembryo."
- W. J. MEEK: "On the Selective Action of Certain Drugs."
- S. METALNIKOFF: "Sur l'immunité de la *Galleria mellonella* vis à vis des cacilles tuberculeux."
- A. MEYER: "The Homologies of the Mesial Wall of the Cerebral Hemisphere of Vertebrates."
- C. S. MINOT: "Changes in the Nuclei of Vertebrates in Relation to Age."
- T. H. MONTGOMERY, JR.: "Fertility of Egg of *Theridium*," "The Maturation and Fertilization of the Spider's Egg."
- A. MRÁZEK: Title not yet received.
- J. P. MUNSON: "The Anatomy of *Ophioglypha Sarsii*," "Observations on the Generation and Degeneration of Sex-cells."
- H. F. NACHTRIEB: "Lateral Line System of *Polyodon spathula*."
- H. V. NEAL: "The Development of the Ventral Cranial Nerves in *Squalus*."

H. W. NORRIS: "The Cranial Nerve Components of *Amphiuma*."

J. P. NUEL: "The Reactions of Flatworms to Light."

C. C. NUTTING: "The Color of Deep-sea Animals Considered in Connection with Phosphorescence."

A. E. ORTMANN: "The Necessity of Survey Work in Zoographical Research," "The Double Origin of Marine Polar Faunas," "Variations and Changes of Environment."

H. F. OSBORN: Title not yet received.

W. PATTEN: "On the Origin of Vertebrates."

S. PATER: "Some of the Earliest Reactions of the Vertebrate Embryo and their Relations to the Nervous System."

J. T. PATTERSON: "On Gastrulation in Birds."

P. PELSENER: "Bipolar Theory," "Considérations sur la genèse du névraxe, spécialement sur celle observée chez le Pélobate brun."

A. W. PETERS: "The Action of Pure Water on Living Cells," "The Function of the Inorganic Salts of the Protozoan Cell and its Medium."

A. PETRUNKEVITCH: "The Sense of Sight in Spiders."

J. P. PORTER: "The Behavior of Birds."

H. PRZIBRAM: Title not yet received.

F. H. PRATT: "Vasomotor Reflexes to Isolated Vascular Areas."

H. E. RADASCH: "Unilateral Absence of Genito-Urinary System and its Relation to the Development of Wolffian and Muellerian Ducts."

B. H. RANSOM: Title not yet received.

A. M. REESE: "Embryology of the Florida Alligators."

W. E. RITTER: "A Point of View with Reference to the Problem of Organic Evolution," "The Problem of Adaptation to Conditions of Life at Great Depths, as exemplified by Simple Ascidians."

L. RHUMBLER: "Zellenmechanik und Vererbung."

L. ROULE: "L'Origine de la notochorde et du neuraxe chez les larves urodeles des Tuniciers."

C. F. ROUSSELET: "Improvements in the Method of Preservation of Rotatoria."

W. ROUX: Title not yet received.

R. F. SCHARFF: "On the Evolution of Continents as illustrated by the Geographical Distribution of Existing Animals."

V. E. SHELFORD: "Behavior of the Tiger Beetles: Its Bearing on Variation and Distribution."

A. E. SHIPLEY: Title not yet received.

C. H. SHULL: "Results of Hybridizing *Bursa pastoris* and *Bursa heegeri*."

W. J. SINCLAIR: "The Santa Cruz Typotheria."

H. M. SMITH: Title not yet received.

J. B. SMITH: "Ridding a State of Mosquitoes."

A. STEUER: "Seasickness."

N. M. STEVENS: "Various Types of Heterochromosomes in the Coleoptera," "The Chromosomes in *Drosophila ampelophila*."

C. W. STILES: Title not yet received.

F. B. SUMNER: "The Effects upon Fishes of Changes in the Chemical or Physical Properties of their Surrounding Medium."

O. P. TERRY and E. P. LYON: "Further Observations on Ferment Activity in Unfertilized and Fertilized Eggs."

J. A. THOMSON: "A New Type of Alcyonarian," "As Regards Germinal Selection."

E. L. THORNDIKE: Title not yet received.

W. L. TOWER: "Experimental Evidence Concerning the Existence of 'Unit Characters' and the Relation of this Evidence to the Theory of Mutation," "Experimental Production of Progressive Evolution without Saltation," "Continuity vs. Discontinuity in Animal Evolution."

C. H. TURNER: "Do Ants form 'Practical Judgments'?"

J. W. VAN WIJHE: "The Chondrocranium in Birds."

T. W. VAUGHAN: "Results of a Study of Recent Madreporaria of the Hawaiian Islands and Laysan."

F. VEJDOVSKY: "Giebt es eine Reduktionsteilung?" "Ueber den Ursprung der Lymphocyten."

H. B. WARD: Title not yet received.

J. WARREN: "Epiphysial Region in Reptilia and *Necturus*," "The Paraphysis and Pineal Region in *Lacerta*," "The Paraphysis and Pineal Region in *Chrysemys marginata*."

A. S. WARTHIN: "Regional Hæmolymph Nodes, a Comparative Study."

E. WASMANN: Title not yet received.

W. M. WHEELER: "Social Insects and the Inheritance of Somatogenic Characters," "The Origin of Slavery among Ants."

B. G. WILDER: "Certain Simplified Terms, with Reasons for their Adoption."

A. WILLEY: "Lecithality, Oviposition and Viviparity."

E. B. WILSON: "Illustrations of the Morphological and Physiological Individuality of the Chromosomes in the Hemiptera."

N. YATSU: "An Experimental Study on the Cleavage of the Ctenophore Egg."

R. M. YERKES: "Behavior of the Dancing Mouse."

E. YUNG: "Le sens de l'humide chez les Mollusques," "Structure des tentacules chez *Helix*."

C. ZELENY: Title not yet received.

Notices have also been received that the following demonstrations will be made:

S. VON APÁTHY: "Certain Instruments for Microtechnique," "Microscopic Preparations."

C. W. BEEBE: "Bird Skins."

W. DANTCHAKOFF: "Microscopic Preparations."

G. A. DREW: "Illustrations of a Method to make Series of Anatomical Drawings."

J. H. EMERTON: "Demonstration Collection of Spiders."

W. JUNK: "Zoological Books."

F. E. LUTZ: "Abnormal Wings of *Drosophila*."

O. MAAS: "Microscopic Preparations."

A. MAXIMOW: "Microscopic Preparations."

S. METALNIKOFF: "Preparations of Blood and of *Bacillus tuberculosis*."

A. PETRUNKEVITCH: "Images in the Spider's Eyes."

C. F. ROUSSELET: "Mounted Slides of Rotifera."

J. A. THOMSON: "Peculiar Aleyonarians."

Members are reminded that notices of communications, demonstrations, etc., should now be in the hands of the General Committee of the Seventh International Zoological Congress, Cambridge, Mass.

For the Executive Committee,

G. H. PARKER, *Chairman*

RADIUM EMANATION¹

IN 1903, it was shown by Mr. Soddy and myself that the spontaneous change of the emanation from radium results in the formation of helium; this observation has been confirmed by Indrikson, by Debierne, by Giesel, by Curie and Dewar, and by Himstedt and G. Meyer. Debierne has shown that actinium chloride and fluoride also develop helium. I have also once detected helium in the gases evolved continuously from a solution of thorium nitrate, and hope soon to confirm this observation.

When the emanation is in contact with, and dissolved in water, the inert gas which is produced by its change consists mainly of neon; only a trace of helium could be detected.

¹From *Nature*, July 18. This letter is apparently the basis of the alleged interview with Sir William Ramsay, cabled to a prominent New York newspaper on July 28 and widely quoted.

When a saturated solution of copper sulphate is substituted for water, no helium is produced; the main product is argon, possibly containing a trace of neon, for some of the stronger of its lines appeared to be present. The residue, after removal of the copper from this solution, showed the spectra of sodium and of calcium; the red lithium line was also observed, but was very faint. This last observation has been made four times, in two cases with copper sulphate, and in two with copper nitrate; all possible precautions were taken; and similar residues from lead nitrate and from water gave no indication of the presence of lithium; nor was lithium detected in a solution of copper nitrate, similarly treated in every respect except in its not having been in contact with emanation.

These remarkable results appear to indicate the following line of thought: From its inactivity it is probable that radium emanation belongs to the helium series of elements. During its spontaneous change, it parts with a relatively enormous amount of energy. The direction in which that energy is expended may be modified by circumstances. If the emanation is alone, or in contact with hydrogen and oxygen gases, a portion is "decomposed" or "disintegrated" by the energy given off by the rest. The gaseous substance produced is in this case helium. If, however, the distribution of the energy is modified by the presence of water, that portion of the emanation which is "decomposed" yields neon; if in presence of copper sulphate, argon. Similarly the copper, acted upon by the emanation, is "degraded" to the first member of its group, namely, lithium; it is impossible to prove that sodium or potassium are formed, seeing that they are constituents of the glass vessel in which the solution is contained; but from analogy with the "decomposition-products" of the emanation, they may also be products of the "degradation" of copper.

A full account of this research will shortly be communicated to the Chemical Society.

WILLIAM RAMSAY.

July 11.